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ABSTRACT

Since an author does not provide all critical information, a text is never fully explicit; it demands that the reader/listener supply missing elements in order to form a coherent and logical whole. A study was conducted to explore both the types of responses urban first grade students made when asked to predict a narrative ending and differences in ability between the fall and spring semesters. Two first grade classes in each of five different reading programs served as subjects. The reading programs were (1) Lippincott (1975), (2) Language Experience, (3) Houghton-Mifflin (1979), (4) Open Court (1979), and (5) Ginn 720 (1976). These programs included analytic and synthetic, language experience, and linguistic approaches. In the fall, each child was read part of a story and asked how he or she thought the story would end. Each response was tape recorded, transcribed, and analyzed. The same procedure was followed in the spring. Qualitative measures were concerned with the convergent or divergent nature of the predictions as well as the changes that occurred from fall to spring. Results failed to show a relationship between the reading program used and the type of response given. Overall, the study found that students were capable of responding with both convergent and divergent predictions at the beginning and end of first grade. (FL)

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Convergent/Divergent Predictions of Urban First Graders

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Convergent/Divergent Predictions of Urban First Graders

How children understand, recall and infer narrative structure, whether in reading or listening, belongs to the study of discourse processes. As a communicative process, discourse comprehension is constrained by the interaction of narrative structure, reader/listener knowledge and the author's knowledge and purposes (Kintch 1977, Frederiksen 1979, Meyer 1977, Warren, Nicholas and Trabasso 1979, Thorndyke 1977).

The purpose of our study was to explore the types of responses of urban first graders when asked to predict a narrative ending and to determine if there were differences from Fall to Spring. Both qualitative and quantitative aspects were analyzed.

Related Literature

Studies of story comprehension and recall reveal how reader/listeners use story grammar (the elements of narrative structure) and story schema (a cognitive "script", based on prior knowledge) in generating inferences and predicting outcomes (Bower 1976, Stein and Glenn 1979, Adams and Bruce 1980, McConaughy 1982, Rumelhart 1980).

Since an author does not provide every bit of critical information, a text is never fully explicit; it makes demands on the reader/listener who has to supply missing elements in order to form a coherent and logical whole. Thus, comprehension of a story is a constructive process. Even children who are just beginning to acquire reading skills give evidence of assimilating the materials into existing knowledge structures (Blachowitz 1978). What is essential, then, in comprehending and recalling a story is that the reader/listener have strategies for "parsing" the structural parts--typically labeled as setting, episode, conflict, resolution, etc., and a set of schematic expectancies which allow him/her to make

inferences and integrate the information (Rumelhart 1975, Mandler and Johnson 1977, Tierney, Bridge and Cera 1978). In discussing the organizational processes used by children during story encoding and retrieval, Stein and Glenn (1979: 115) point out that "When reading or listening to a story, subjects expect certain patterns of information. . . . If the grammar corresponds to the internal structures used by subjects during story comprehension, several predictions concerning both the organization of incoming information and the generation of new information can be made."

Procedures

Two first grade urban classes in each of five different reading programs were selected in northern New Jersey. The reading programs were: Lippincott, 1975 ed. (N=41); Language Experience (N=36); Houghton-Mifflin, 1979 ed. (N=32); Open Court, 1979 ed. (N-27) and Ginn 720, 1976 ed. (N=28). These programs included analytic and synthetic methods, language experience and linguistic emphases.

In the Fall, we told each child, in an individual session, that we would read part of a story, and would then ask him/her to tell how he/she thought the story would end. If a response was delayed, the question was repeated or rephrased. Additional comments to encourage continued responses were given when necessary. Each child's response was tape-recorded, transcribed and analyzed. In the Spring, the same processes of reading part of the same story, eliciting a prediction, transcribing and analyzing the taped responses were repeated.

The qualitative measures were concerned with the nature of the predictions, i.e. convergent or divergent, as well as the changes that occurred from Fall to Spring. We also noted the reciprocal effects of story schema and story grammar. The quantitative measures compared the distribution of convergent and divergent categories from the Fall to Spring of the total population, and of the individual programs separately.

The Story

The story chosen for this study, The Horse Who Lived Upstairs, by Phyllis McGinley (Lippincott, 1944), was selected by first grade teachers as being appropriate, appealing for the population sample, and for its potential for various endings.

The story has the general structure of a folktale. The protagonist is Joey, a horse who lives in a city apartment and who pulls a fruit and vegetable wagon for his master. Although well treated and loved by his master and by neighborhood friends, Joey is unhappy, for he yearns to live in the country. His unhappiness is compounded after subsequent events bring him to a farm where he is overworked, neglected by the farmer, and friendless. His conflict is resolved when his former master appears one day to take him back to the city, where he pulls the wagon again and is reunited with old friends.

Our version of McGinley's story is reproduced below. We shortened and revised the lengthy original story to (1) provide a synonym or paraphrase for a term or phrase likely to be difficult for a six year old; e.g. unhappy for discontented, and run for kick up heels: (2) eliminate minor or irrelevant details and descriptive phrases, such as "a barn with a weathervane on top" and (3) eliminate unfamiliar "literary" and complex language, such as, "How I long to sip fresh water from a babbling brook," or "He would sniff discontentedly at the old bathtub near the elevator which served him as a watering trough." Such sentences were recast into the general, central theme of Joey's desire to live in the country where there was fresh air and green meadows. Our version of the story follows:

> Once there was a horse named Joey who lived in the city in an apartment building. He pulled the wagon for his master who sold fruits and vegetables in the city streets. His master treated him well, gave him plenty of food and a warm blanket. The policeman gave him sugar, a nice old lady patted him on the nose, and children rode on his back for fun. He also had another horse to talk to, for a friend.

But, Joey was very unhappy. He wanted to be a country horse and live where there was lots of fresh air. He wanted to sleep in a nice red barn, and he wanted to run in green meadows. So, he was very unhappy. One day, the master told Joey that he could deliver his fruits and vegetables better in a truck, and so he took Joey out to the country to work for a farmer instead.

At first, Joey was very happy. He lived in a big red barn. He had lots of fresh air, and he ran around in green meadows. There were other animals on the farm, too. But soon he found that the farmer worked him very hard. The big red barn had no heat in it and he was very cold. Sometimes the farmer forgot to feed him, and he was very hungry. No one gave him lumps of sugar; no one patted him on the nose, and the children teased him instead of riding on his back. Poor Joey! He was very unhappy.

Then, one day Joey looked out of the barn and saw his old master coming into the barn. The master told Joey that he didn't like his new truck at all. Now, what do you think happened next?

Categories of Responses

The children's responses were assigned into one of the following three categories, according to the descriptors:

	Category	Descriptors
1.	No prediction	. No response . Simple recall of story elements . Nonsense . No solution to the problem
2.	Convergent Response	. Sensible, expected solution to the problem; prediction relating to the main idea of returning to the city; e.g., "city again," or house/home, work (selling fruits and vegetables), being fed, patted, given sugar, warmth, happy to return to the master, etc.
3.	Divergent Response	. Sensible, yet unexpected prediction related to the solution of either Joey's or the master's problem (or both); should have internal consistency (logical and cohesive)

Inter-rater Consistency

Inter-rater consistency was determined by having two reading specialists independently analyze and categorize the responses (Diggs - Wickes 1981, Luyster 1981). The Chi Square statistic was used to determine if a significant difference

existed between the distribution of categories assigned by the authors and those assigned by the raters. With d.f. = 2, the raters obtained Chi Square values of 0.879 and 1.09 respectively. Therefore there was no significant difference between distribution of categories assigned by the authors and those assigned by the independent raters.

Analysis of Responses: Changes from Fall to Spring

In the analysis of the data it was observed, in comparing the Fall and Spring results, that there were changes in the responses of many of the children along the dimensions of the above descriptors. For example, 53% of the total responses in the Fall were labeled as "No Prediction", whereas in the Spring, this percentage decreased to 33%. Thus, many more children made predictions in the Spring. The following chart presents several examples of shift in categories of responses from Fall to Spring:

Type	Fall	Spring
I.	No prediction	Convergent prediction
II.	No prediction	Divergent prediction
III.	Convergent prediction	Convergent prediction
IV.	Convergent prediction	Divergent prediction
V.	Divergent prediction	No prediction

Samples Illustrating Types of Responses

The following section provides samples from the data illustrating the three categories of responses (No Prediction, Convergent Prediction, Divergent Prediction), and our comments on the shifts and developmental changes that occurred from Fall to Spring.

Type I Fall: No Prediction Spring: Convergent Prediction

Child W.W.

Fall: Joey had a big master, and he, let's see, and he had some . . . gave him some food, right, and then, this here, this, he forgot to give him food. He came back and he was really hungry. And little Joe, he was very, very really hungry and he came back. And I forget the rest of it. And I guess he went someplace to go find the . . . I guess he went somewhere.

Spring: They rode on Joey's back after that. And the farmer let him go down there to pull the wagon for his master. And all the kids teased him and rode on his back. And he have fresh air. And all the kids was teasing him and riding on his back.

Comment: The Fall response reveals only the child's attempt to recall the facts of the story, focussed on food and hunger. It is somewhat fragmented, incomplete, and lacks a prediction. In contrast, the Spring response includes several convergent ideas related to the horse's reunion with his master; the phrase "down there" implies return to the city, to former activities and friends.

Type II Fall: No Prediction Spring: Divergent Prediction

Child R.R.

Fall: Joey didn't like the farm. He couldn't like food. They didn't ride on his back. Joey was happy. Joey was alone.

Spring: The farmer came back and said he didn't like his truck. The children had teased him and didn't ride on his back. Nobody gave him food and nobody patted his nose. The master is gonna sell Joey for money so he can get another horse like him.

Comment: In contrast to the Fall response, which is a terse and choppy retelling of the horse's experience on the farm, the Spring response offers a prediction and a solution to the master's problem. Although momentarily confused about the respective roles of the master and farmer, the child did make a divergent prediction in the master's selling of Joey to buy another horse. The short, disconnected sentences in the Fall can be contrasted with the longer, more complex structures and also greater cohesiveness in the Spring response.

Type III Fall: Convergent Prediction Spring: Convergent Prediction

Child S.D.

Fall: He had got out of the barn and went with his old master again. And then, the kids had rode on his back and they had patted his nose, and they had . . . I don't know. No, that's all I can think of right now -

Spring: That he wanted to go back with his other master. And they wouldn't be teasing him no more. And they could ride on his back again.

Comment: Both responses are clearly convergent, and there is little change in content and quantity. Yet, it is interesting to note the repetition of the past perfect tense in the Fall (had got, had rode, had patted); although used inappropriately, these verb phrases reveal a child's attempt to practice and master a new linguistic form.

Type IV Fall: Convergent Prediction Spring: Divergent Prediction

Child J.S.

Fall: I think that Joey tells his master that he wants more sugar, and the kids tell Joey they want to ride on his back. And Joey will go back and be very happy, and his master will be happy again. He went back 'cause the master didn't like the truck.

Spring: The farmer said, "Get out of my barn." The farmer opened the barn and let him out. Joey gets in the truck and drives off to the city. He gets out the cart and probably he'll give it to some other horse. He wants to come back and tell the farmer he is sorry.

Comment: The Fall response clearly reveals the horse's happy reunion with his master, a convergent ending. The response is a statement of cause and effect; Joey went back because the master was dissatisfied with the truck. The Spring response opens new avenues of divergent possibilities; Joey drives back to the city and gives his old cart to another horse. In both responses, there seems to be an "altruistic" element in Joey's behavior.

Type V Fall: Divergent Prediction Spring: No Prediction

Child J.P.

Fall: Then he got sad. Then he, then he went away. And he met another farmer and he live with him and brought him a nice chuck daddy with love. And he might sell vegetables. Then he had started selling vegetables, and gave him all the food he wanted. And then he wanted to stay with him. And then he wanted to stay with him. And then he started living with him forever. I said all of that? And then he loved him; the farmer loved him, the horse. And then he stayed there and they gave him something to eat, all he wanted! And both of them turned to friends. I got one more. And then he loved him forever. That's all now.

Spring: The children used to ride on his back, but now they don't like him no more. They was teasing him a lot. And they didn't give him any food most of the time. He didn't have nobody, no friends to play with or talk with. I got a little bit more. He didn't want to live in a house. Kids teased him.

Comment: The child's divergent response in the Fall seems quite fluent and coherent. Joey's problem is solved by running away and meeting another farmer who provides an abundance of food, love and emotional security. The Spring response, although equally fluent, was simply a reiteration of the story elements and lacked a prediction.

Findings

One of the findings revealed in the responses of several children was a confusion or confounding of the terms "farmer" and "master" as in, for example, "He went with his old farmer . . . and married with another horse," or "The master forgot to feed him and he was cold," and "The farmer came back and said he didn't like his truck."

A corollary to this was the attempt made by several children to paraphrase the names of those events, activities or places for which they lacked the vocabulary and idiom.

For example:

> He pulled his neck and then he found his master and then the master feeds him and liked him and then he took him to a farm. Then he didn't like it at the farm. Then Joey told him he didn't like it at all. Then he took him out of the farm and took him to the place that he like. Then kids patted him on his nose 'cause before they didn't and he was very sad and he didn't like the place. And Joey the horse was very sad. (Child J.J.)

The opening sentence, "He pulled his neck" describes, in part, the horse's action in pulling the wagon, and the clause in the fourth sentence, " . . . took him to the place that he like" is a paraphrase of going back to the city. Another child substituted the phrase "old barn" for the concept of the city apartment, e.g. "So he took him out of the barn. He went with his master to his old barn and stayed."

Typical, also, is the dislocation in sequence, as in J.J.'s response, above. For example, the last sentence, "Joey was very sad," seems not to be the ending nor the last link in a chain of events, but of reiteration of Joey's unhappy emotional state before "[the master] took him to the place that he like." Also frequent are the syntactic parallelisms (Roemer 1982) demonstrated by the clauses beginning with the pattern "Then he . . . Then the master . . " etc.

An incipient awareness of conventional "happily-ever-after" story endings was revealed in only few of the responses, as in the following:

Child J.D. He takes him home. And when he got home the ladies gave him sugar. And they patted him on the back, and the kids rode on him. And he was happy. He was never sad. He was always happy. I can't think. Write "The End" at the end.

Child E.W. We took him back to the city and the city and the children rode on his back and the nice old lady pat him on the nose and they lived happy ever after.

Child J.J. . . . . He got married with another horse and after had had babies. And they were real, real happy.

Since the ability to infer omitted information is akin to predicting outcomes, the question which must be posed at this point is: Why were 33% of the children in this study still unable to generate a prediction in the Spring?

In order to explore this question we must examine (1) the structure of the story used in this study, (2) the kinds of knowledge six year olds need in order to infer missing information, or predict the ending, and (3) the developmental stage of first grader's responses to stories.

What kinds of prior knowledge and inferences are necessary in order to comprehend this story and to anticipate the ending? First of all, story knowledge is required; i.e., that an animal, especially in folk tales and fables, can talk and take on other human characteristics. (This aspect will be discussed more fully below.) Secondly, the comprehension of plot development requires three broad types of inferencing: informational inference, logical inference and value inference (Tierney and Mosenthal, 1982). The informational inferences in this story deal with the propositional relationships conveyed by the "who", "what", "when", and "where" -- that is, the referential and cohesive aspects of the discourse. Such inferences require, for example, the knowledge that the pronoun he in the second sentence of the story (see page above) refers to Joey, or that the phrase "treated him well" means 'taken care of', or that the sentence, "He pulled the wagon for his master who sold fruits and vegetables," implies that the produce was loaded on the wagon, and so on. Such discourse inference is a text-based "bottom-up" process (Fredericksen 1979, Rubin 1980).

The logical inferences require comprehension of cause and effect, of goals, events and outcomes. Why was Joey unhappy? What does it mean to live in the country as opposed to the city? What schema is activated by the "city vs. country" opposition? Such knowledge may be culture-specific; young children in urban communities have various experiences and expectancies (or, perhaps none at all) about city versus country horses, about fruit and vegetable peddlars, or cruel or indifferent farmers.

Value inferences are high-level, "top-down" processes which deal with recognizing the element of the fable in the story, the implied moral which can be

rendered as "Happiness is in one's own backyard," or, possibly, "Home is where comfort, kindness and friendship dwell." It is a kind of prodigal son theme, and prior knowledge of this thematic structure leads to anticipation of the story ending -- a view convergent with that of the author.

In exploring the higher level aspects of children's literature, such as point of view, insight into character's minds and responses to interpersonal conflicts, Steinberg and Bruce (1980) point out that although such aspects provide essential interest, they also contribute to story complexity and difficulty for young readers. What is the conflict in the story of Joey? It is both an environmental and an internal conflict, according to the criteria set up by these researchers. However, internal conflict occurs least frequently in the children's stories they sampled in their analysis of types of conflict found in both basal and trade books (pp. 14-15). Also, McConaughy's (1982) study of developmental changes in story schema shows that young children focus more on physical causality, the "what happened" aspects, rather than on psychological and social inferences.

Perhaps the most illuminating insights are provided by Applebee's investigation (1978) of the developmental stages in children's recognition of fictional elements. The six year old is on the threshold of, or in partial transition, in grasping the fictional aspect of characters; there is often ambivalence in perceiving some parts of the story world as fiction while other parts might be "true". Most importantly, children of six are beginning to develop certain expectations about the role or behavior of stock characters of fantasy and fable -- the fairy, the witch, the wolf, the lion, the fox and the rabbit. But horses do not belong to this set of stock characters! And one can say, as a generalization, that most urban children are not familiar with horses, except those seen on TV Westerns, let alone fictional horses who live in city apartments. Therefore, children would not have the same set of schematic expectations to Joey, the city horse, as they might

have to a stock animal character of fiction. Furthermore, Applebee points out that children respond differently to characters who are only encountered in stories than they do to characters who are also part of the real (non-fictional) world:

> That children develop consistent expectations more rapidly for the fantasy characters is not surprising; a lion in a story and a lion in a zoo will build up conflicting expectations, whereas fairies and witches, restricted to the domain of fantasy, are able to build up a single, clear system of expectations more easily (p. 51).

Quantitative Analysis

In a previous paper (Putnam and Farber, 1983), we reported the results of the statistical analysis of the Fall and Spring data on the following five dependent variables: Total Number of Predictions, Total Number of Words Expressed, Number of T-units, Average Length of T-units and Average Syntactic Complexity.

In contrast to the previous paper which stressed the quantitative analysis of responses, this paper emphasizes the qualitative aspects. Since the responses assigned to each category constituted non-parametric data, Chi Square analysis was used to determine if significant differences existed between Fall and Spring in the distributions of No Prediction, Convergent and Divergent Predictions, and also, if significant changes occurred within each separate reading program from Fall to Spring.

A comparison of the convergent-divergent distribution of the total population of the five programs from Fall to Spring resulted in X^2 = (5.11 with d.f. = 2, a significant difference with $P < .001$ level. The major change occurred in a decrease, from Fall to Spring, from 53% to 33%, in the number of responses labeled "No Predictions." Thus, significantly more children responded with a prediction in the Spring than had done so in the Fall. The major direction of this change, although not statistically significant, was toward a convergent response, about 16% more. The percentage of children who were able to give a divergent response increased 4% in the Spring. See Table I, below.

Table I. Convergent - Divergent Percentages

	0	CONVERGENT	DIVERGENT
FALL	53%	34%	13%
SPRING	33%	50%	17%

A comparison of the Fall-Spring distributions of the three categories (No Prediction, Convergent or Divergent Response) was made for each of the five reading programs separately. Chi Square analyses showed there were no significant differences between Fall and Spring distributions for any of the five participating programs (Table II). Thus none of the five reading programs seemed to be related to or affecting the types of responses.

Table II. Fall - Spring Comparison of Convergent - Divergent Responses by Reading Programs

Reading Programs	N	Chi Square	d.f.	Prob.	
Lippincott	41	5.97	4	0.20	N.S.
Language Experience	36	3.61	4	0.46	N.S.
Houghton-Mifflin	32	2.51	4	0.64	N.S.
Open Court	27	4.07	4	0.39	N.S.
Ginn 720	28	4.90	4	0.29	N.S.
Total	164				

Conclusions

None of the five reading programs seemed to be related to or affecting the types of responses since there were no statistical significant differences in the shifts that took place from Fall to Spring. The major shift was the decrease, from 53% to 33%, from Fall to Spring, in the number of children whose responses were labeled as No Prediction. Therefore, a significantly greater number of children were able to generate a prediction in the Spring as compared to the Fall. The predominant direction of this change, although not statistically significant, was toward a convergent response.

We have investigated the possible reasons for the 33% of children in our study who were unable to generate a prediction. These reasons pertain to:

. The necessary prior knowledge, especially the logical and value inferences necessary to grasp the theme and plot of the story.

. The nature of the internal conflict in the story, a type which occurs infrequently in children's stories.

. The developmental stage of story schema in six year old children who are on the threshhold of recognizing fictional elements.

. The unfamiliar fictional role of the main character; the difficulty in setting up expectations for an unfamiliar fictional character who does not belong to the category of stock characters, yet is part of the real world.

Nonetheless, the study indicates that first graders are perfectly capable of responding with both convergent and divergent predictions at the beginning and end of first grade.

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